

09/914256
518 Rec'd PCT/PTO 22 AUG 2001PCT/EP00/11717
BIEDERMANN MOTECH GmbH

2/pvls

Foot prosthesis

The invention relates to a foot prosthesis. From the brochure BIEDERMANN MOTECH, Unterschenkel-Systeme (lower leg systems), page 15, a foot prosthesis is known which is formed by a first spring element and a second spring element connected thereto. The first spring element extends from the toe region to the lower leg region and is formed in a convex fashion as viewed from the top. In the lower leg region the free end supports an adapter for connecting to the lower leg element of a prosthesis. In the region around the ball of the foot the spring element is firmly connected on its lower side to the upper side of the front foot side end of a second spring element by means of screws, which second spring element extends with its free end to the toe region. The first spring element consists of a carbon fiber composite material and has the appearance of a leaf spring having a width of about 4 cm in the ball region and a thickness of 3 to 4 mm.

It is an object of the invention to provide a foot prosthesis with even better gait characteristics.

This object is achieved by a foot prosthesis according to claim 1.

Further embodiments of the invention are characterized in the dependent claims.

Further features and advantages of the invention will be apparent from the description of embodiments with respect to the figures, where

- Fig. 1 is a lateral view of a first embodiment of the invention;
- Fig. 2 is a corresponding lateral view of a second embodiment;
- Fig. 3 is an illustration similar to the one in Fig. 2;
- Fig. 4 is a plan view of the object shown in Fig. 3 in the direction of arrows A'-A; and
- Fig. 5 shows the object shown in Fig. 1 in an artificial foot represented in section.

The first embodiment shown in Fig. 1 comprises a first spring element 1 and a second spring element 2. Each of the spring elements is formed in a concave fashion as viewed from the top. The first spring element 1 extends with one free end 3 from the toe region to its opposite free end 4 which is held in an adapter 5 that can be connected to the lower leg portion of a prosthesis. The second spring element 2 extends with one of its free ends 6 from the heel to its other free end 7 which is held in the adapter 5.

The bending of the two spring elements is selected such that in their inoperative position the two ground-side free ends 3, 6 are supported flat on the ground and the opposite free ends 4, 7 abut in parallel fashion with their convex-side surface, as can be seen in the figure, and are held in a slot 7' of the adapter 5 and are fixed in the adapter 5 by a locking screw 8.

As can be seen from the figures, the front foot region of the first spring element 1 and the heel region of the second spring element 2 are connected to each other through a tension element 9. As can be best seen in Fig. 4, the tension element is formed in a ribbon-like manner and is formed as a stretch-free tension ribbon. The tension element 9 is connected in a tension-proof fashion with one of its ends as close as possible to the free end 6 of the second spring element 2 using rivets 10 and with its other free end close to the free end of the first spring element 1 using rivets 11. The connection location of the

The foot prosthesis formed in this manner provides for especially advantageous gait characteristics starting by setting the foot in its heel region on the ground and finishing with a rolling movement through the front foot.

In order to achieve the advantage that the tension element 9' is fixed as close as possible to the free ends 3, 6 using the rivets 10, 11 and that the tension element acts on the outermost free ends on the one hand, and the advantage that the tension element does not completely rest on the ground on the other hand, there is provided, a distance from the free end 3 where the first spring element 1 has just enough clearance from the ground, a slit 12 extending along a direction transverse to the longitudinal direction of the first spring element 1', as can be best seen in Fig. 4. This slit is designed to lead the tension element 9' across the slit 12 all the way to the forward free end 3 of the first spring element 1'. Starting from the slit 12, the tension element 9' is arranged in closely fitting relationship with the convex portion of the spring element 1' and is firmly connected thereto in the toe region by rivets 11, as is best seen in Fig. 2.

Alternatively, it is also possible to arrange the tension element 9 at the bottom surface of the first spring element 1

and all the way to the free end, if it is accepted that the tension element will then rest on the ground.

Referring to Fig. 5, the embodiment described first is introduced into an artificial foot 13 in a basically known fashion.

102280-33ch1000